

BOLETALES AND AGARICALES (FUNGI) FROM NORTHERN YUNNAN, CHINA I. REVISION OF MATERIAL COLLECTED BY H. HANDEL-MAZZETTI (1914—1916) IN LIJIANG

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Abstract About 71 species of Agaricales, Boletales and Cantharellales are reported by Lohwag in Handel-Mazzetti (1937) from N-Yunnan, China. The bulk of material was collected on the forested slopes of the mountain massif Yulong shan, north of Lijiang. The revision of the authentic specimens yielded the following results: original identification is confirmed for 32 taxa, another 32 species are misidentified, finally the material of 7 records is absent in WU.

Key words Agaricales, Boletales, H. Handel-Mazzetti

Introduction

In N-Yunnan, China, the Austrian H. Handel-Mazzetti was the first professional botanist who collected fungi for scientific purposes. The bulk of his material was gathered in 1914 and 1916 when Handel-Mazzetti's expedition camped in the small village of Nulugu [Ngulukō (雪松村)] about 25 km N of Lijiang (=Likiang, Lijiang or Li-chiang, 2800 m, 26.51 N, 100.16 E). For several weeks the fungus flora was explored in the mixed coniferous-deciduous forests which extend from 2900—3800 m on the calcareous slopes of Yulong shan (5596 m), an isolated mountain massif situated in the eastern horse-shoe bend of the Yangtse river.

After Handel-Mazzetti's eventual return to Vienna the Yunnanese macro-mycetes subsequently were examined by G. Bresadola, H. Lohwag, and R. Singer (Russulales exclusively, not taken into account yet in the revision). Several exsiccata also were studied by K. B. Boedijn, Th. Cernohorsky and

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Abbreviations, HM. -Handel-Mazzetti; K-Herbarium, Kew, Surrey, England; WU-Herbarium, Botanical Institute, University, Vienna, Austria; ZT-Herbarium, Geobotanical Institute, ETHZ, Zürich, Switzerland (Herbarium Horak)

F. Litschauer. Finally the results of the identifications have been published by Lohwag (in Handel-Mazzetti, 1937) in vol. 2 of the *Symbolae Sinicae*. Handel-Mazzetti bequeathed the whole set of his Chinese collections to the Herbarium of the Botanical Institute, University of Vienna (WU), where the specimens are still kept in a separate collection named "Handel-Mazzetti, Iter sinense, 1914—1918".

Except a few taxa (cf. list below) the present author located in WU all Agaricales, Boletales and Cantharellales listed in Lohwag (1937). Unfortunately the majority of the authentic exsiccata is now in rather bad condition, i. e. either eaten by insects or destroyed by moulds. For that reason microscopical analysis often was hampered for no adequate preparation of cuticular or lamellar characters can be achieved from the damaged basidiomes. It remains open whether the specimens arrived already in miserable condition in Austria years ago or due to the lack of appropriate curating, they deteriorated in the WU-Herbarium during or after world-war II. Apart from the dry material there is no additional information (field books, diaries, notes or drawings, etc.) available today (pers. comm. Dr. Schönbeck, WU). It is unknown if Handel-Mazzetti provided such data to the above-mentioned mycologists to facilitate their identification work. As a rule ecological information about the collecting site(s) is rather scarce and seems to be restricted exclusively to the occasional annotations scribbled on the original labels. However, a general description of the vegetation both on Yulong shan and the surroundings of Lijiang is published in several papers written by Handel-Mazzetti [9, 10, 11].

Based upon my personal experience with the authentical exsiccata of agarics and boletes from Yunna Handel-Mazzetti's specimens most likely have never been documented by descriptions essential for accurate identification. In combination with the poor material, this important lack of information must be blamed for the rather unusual high number of misidentifications as shown in the following lists.

Unfortunately all (wrong) names of taxa mentioned in Lohwag's paper uncritically have been included in several subsequent lists and catalogues on the Chinese mycoflora [37, 38]. The new data presented in this submitted revision prove, however, that the occurrence of many taxa is not confirmed any longer for Yunnan, and therefore numerous published floristic and mycogeographic data and conclusions are incorrect and need reexamination [42, 43, 44].

In July–August 1985 the author followed an invitation by the Academia Sinica (Kunming Botanical Institute) to carry out mycological field work near Lijiang at the same localities visited by Handel-Mazzetti about 70 years earlier,

My own specimens gathered during this expedition and the personal knowledge of the ecological situation on the original collecting sites greatly helped to elucidate the often fragmentary data extracted from the badly preserved material in Handel-Mazzetti's herbarium.

Results of revision

In the following list citation and numerical arrangement of taxa strictly follow the original paper by Lohwag [23]. Bold print refers to results of revision or valid species names.

The number(s) in brackets refer to relevant data published by authors filed in Literature.

For microscopical examination dried material of specimens was mounted in KOH (3 %).

1. **Gastroboletus boedijni** Lohwag -HM. 12951 (holotype)

Contrary to an earlier report [12] the type specimen is actually kept in WU [32]. Detailed description and illustration of the basidiomes are found in [32].

Spores $11.5-15 (-19) \times 4.5-5.5 \mu\text{m}$, subfusoid, rarely bean-shaped, pale yellow, smooth, no germ pore. Basidia $35-40 \times 8-9 \mu\text{m}$, 4-spored. Cystidia not observed. Pileocutis ?.

2. *Boletus lividus* Bull. -HM. 12930

=**Suillus** sp.

Single moulded basidiome. Spores $6.5-7.5 \times 2.5 (-3) \mu\text{m}$, slender fusoid, yellow-brown.

The microscopic data clearly indicate that the material does not represent *Gyrodon lividus* (Bull. : Fr.) Sacc.

3. *Boletus rufus* Schaeff. -HM. 12865

=**Leccinum aurantiacum** (Bull. ex St. Amans) S. F. Gray

On the strongly moulded basidiome the red-brown colour of the pileus is still detectable. Spores $11-14 \times 3.5-4.5 \mu\text{m}$, fusoid. Cheilocystidia and structure of pileicutis identical with European collections [7, 31, 39].

4. *Boletus luteus* L. -HM. 12946

=**Suillus luteus** (L. : Fr.) S. F. Gray

All microscopical characters typical for the taxon [25, 34, 35]. Spores $7.5-10 \times 2.5-3 \mu\text{m}$, slender fusoid, yellow-brown. Cystidia subclavate, with brown plasmatic pigment, in bundles.

5. ? *Boletus ravenelii* Berk. & Curt. -HM. 12850

=**Pulveroboletus** sp.

Single well preserved basidiome with distinct yellow veil remnants. Spores $7.5-9.5 \times 4-4.5 \mu\text{m}$, subfusoid, yellow-brown.

The spores of the present collection are distinctly shorter as in the type material of *B. ravenelii* [12] or confirmed records [3, 6, 18, 35, 36]. Shape and size of the spores as found in coll. 12850 definitely exclude its identity with *Pulveroboletus frians* Corner [6] or *P. shoreae* Sing. & Singh [15, 33]. However, the Yunnanese material is likely to represent the Indian *P. flavipes* (Berk.) Horak [15] originally described from the Khasi Hills in southern Assam.

6. *Boletus subtomentosus* L. -HM. 10525, 12917

= *Xerocomus subtomentosus* (L. : Fr.) Quél.

The two collections are identical and obviously represent a form of the variable *X. subtomentosus* [31, 39]. Spores $11-13 \times 4.5-5 \mu\text{m}$, fusoid, yellow-brown.

7. *Boletus edulis* Bull. (f. *gracilis*) -HM. 12933

= *Boletus* sp.

Completely moulded single basidiome. Stipe cylindrical with swollen base. Spores $11.5-13 \times 4-5 \mu\text{m}$, fusoid. Cystidia $40-60 \times 5-10 \mu\text{m}$, very slender cylindrical to subclavate.

The microcharacters are different from those in typical *B. edulis* [12, 31, 39]. Handel-Mazzetti's specimen resembles the collection of *B. edulis* ss. Chiu [3, 4] and both probably represent a taxon close to *B. aestivalis* Paulet, Fr.

8. *Boletus kauffmanii* Lohwag -HM. 12947 (holotype)

The type material consists of single moulded basidiome with rather large boletelloid pores. For macroscopical description cp. Lohwag [23].

Spores $10-13 (-14) \times 4-4.5 \mu\text{m}$, fusoid, pale yellow-brown, smooth. Basidia $25-30 \times 7 \mu\text{m}$, 4-spored. Cheilocystidia and pleurocystidia $40-60 \times 10-12 \mu\text{m}$. Pileocutis an irregular palisade composed of cylindrical, short-celled hyphae, $4-7 \mu\text{m}$ diam.

9. *Boletus chromipes* Frost (f.) -HM. 12940

= *Leccinum chromapes* (Frost) Sing.

Four basidiomes severely damaged by mould. Base of stipes distinctly chrome yellow.

Spores $11-14 \times 5-6 \mu\text{m}$, subfusoid to elliptical, pale yellow-brown, membrane rather thick-walled. Basidia $26-32 \times 10-12 \mu\text{m}$, 4-spored. Cystidia inconspicuous, subclavate. Pileicutis composed of gelatinized cylindrical hyphae, $2-4 \mu\text{m}$ diam., with pale yellow-brown plasmonic pigment. Clamp connections absent. For description and illustration [24, 35].

10. *Paxillus panuoides* Fr. (f. *sporis minoribus*) -HM. 12884

=Paxillus sp.

Two well preserved basidiomes with lateral stipe. Microscopical and macroscopical characters partly agree with material recently described by Zang [42] from Yunnan-Tibet. However, the spores of European collections of *P. panuoides* are distinctly larger and therefore 12884 is not considered conspecific.

Spores $3.5-4.5 \times 2.5-3 \mu\text{m}$, ovoid, pale yellow, smooth. Cystidia absent. Macroscopically similar to *P. curtisii* [28, 42].

11. Gomphidius maculatus (Scop.) Fr. -HM. 12870

=?, no material in WU.

12. Hygrophorus erubescens Fr. -HM. 12745

=?

Three well preserved basidiomes. Spores $6-7 \times 4-4.5 \mu\text{m}$, larmiforme, hyaline, inamyloid.

Spores of typical *H. erubescens* Fr. [1, 16, 19] measure $6-10 \times 5-6 \mu\text{m}$ hence identification doubtful.

13. Hygrophorus agathosmus Fr. -HM. 12848

= ?

Single moulded basidiome with few hyaline spores ($6-7.5 \times 4-5 \mu\text{m}$) too small for *H. agathosmus* [1, 16, 19] whose spores range from $7-11 \times 4.5-6 \mu\text{m}$.

14. Hygrophorus chrysodon (Batsch) Fr. -HM. 10525

Three moulded basidiomes. The distinctive subcommaform spores ($8.5-10 \times 4-5 \mu\text{m}$) perfectly match European and north American material [1, 16].

15. Hygrophorus pratensis (Pers.) Fr. -HM. 10072, 12852, 12967

= **Camarophyllus pratensis (Pers.: Fr.) Kummer**

The microcharacters found on the three collections agree well those of this wide-spread species in the northern hemisphere [1, 16, 22].

16. Hygrophorus virgineus (Wulf.) Fr. -HM. 819

=?

Mixed collection: 1. Exsiccata with white pileus; ixocutis and larmiform spores exclude *H. virgineus*. 2. Exsiccata with brown pileus; hyphae of ixocutis with conspicuous brown plasmatic pigment; spores ellipsoid. Unknown taxon.

17. Hygrophorus niveus (Scop.) Fr. -HM. 12863

= **Hygrophorus niveus (Scop.: Fr.) Wünsche**

Four well preserved basidiomes. Pileus -25 mm diam., lamellae decurrent. Spores $6-8.5 \times 4-5 \mu\text{m}$, larmiform. Ixocutis composed of strongly gelatinized hyphae, $2-5 \mu\text{m}$ diam. Clamp connections on septa.

18. Lentinus cyathiformis (Schaeff.) Bres. -HM. 12859

Two specimens in good condition. No veil remnants on minutely squamulose stipe. Spores $8.5-11.5 \times 3-3.5 \mu\text{m}$, subfusiform, weakly amyloid. Cheilocystidia $50-85 \times 4-6 \mu\text{m}$, cylindrical to subclavate. Clamp connections present.

All characters agree with European collections [2, 27, 29].

19. *Panus stipticus* (Bull.) Fr. -HM. 12895

= *Panellus stipticus* (Bull.: Fr.) Karst.

Exsiccata well preserved. Spores $4-5 \times 2-2.5 \mu\text{m}$, ellipsoidcylindrical, amyloid.

20. *Pleurotus ostreatus* Jacq. -HM. 7066

= *Pleurotus ostreatus* (Jacq.: Fr.) Kummer

Material in good condition. Spores $8.5-10 \times 3.5 (-4) \mu\text{m}$, cylindrical to subballantoid, amyloid.

21. *Clitocybe cinerascens* (Bull.) Bres. -HM. 10106

= *Lyophyllum fumosum* (Pers.: Fr.) Kühn. & Romagn.

Several well preserved basidiomes, single and in cluster. Spores $4-4.5 \mu\text{m}$, globose, hyaline, inamyloid, smooth. Cystidia none.

In the current literature *C. cinerascens* is considered a colour variety of *L. fumosum* which belongs to the *L. aggregatum*-complex [22].

22. *Armillaria mellea* (Vahl) Fr. -HM. 12849, 12858, 12876

= ?, no material in WU.

23. ? *Tricholoma albobrunneum* Pers. -HM 10090, 10103

= *Tricholoma albobrunneum* (Pers.: Fr.) Kummer -HM. 10103

Spores $4.5-5 \times 3.5 \mu\text{m}$, ellipsoid, inamyloid. Hyphae of ixocutis with yellow-brown plasmatic and encrusting pigment. Clamp connections absent.

Microcharacters agree well with European material [22].

= ? -HM. 10090

Two badly preserved basidiomes. Spores $4.5-6 \times 3.5-4 \mu\text{m}$, oval to subglobose, hyaline, inamyloid. Ixocutis strongly developed, composed of hyphae with conspicuous, in KOH red-brown plasmatic pigment. Clamp connections present on basal septum of basidia but absent on cuticular hyphae.

This material definitely does not represent *T. albobrunneum*.

24. ? *Tricholoma psammopus* Fr. -HM. 10082

= *Tricholoma* sp.

Two basidiomes in good condition. Spores $3.5-5 \times 3-3.5 \mu\text{m}$, sublar-miform, hyaline, inamyloid. Clamp connections none.

The morphology of the spores is different as in European material [22].

25. ? *Tricholoma imbricatum* Fr. -HM. 10085

= *Tricholoma imbricatum* (Fr.: Fr.) Kummer

Spores $4.5-5.5 \times 3-3.5 \mu\text{m}$, ovoid, hyaline, inamyloid.

Characters observed on the two exsiccata agree satisfactorily with European collections [22, 25].

26. ? *Tricholoma tigrinum* Schaeff. -HM. 10901

= ?

Material consists of one young sterile basidiome. Since the septa of the hyphae bear clamp connections a representative of *Tricholoma* accordingly is ruled out.

27. ? *Tricholoma oreinum* Fr. -HM. 411

= ?

Well preserved specimens. Spores smooth (!), ovoid, amyloid. Cystidia absent.

Based upon these observations the material can not represent *Melanoleuca oreina* (Fr.) Kühn. & Maire characterized by strongly amyloid warted spores.

28. ? *Tricholoma leucocephalum* Fr. -HM. 8323

= ?

Single well preserved basidome. Spores $5.5-6.5 (-7) \times 3.5-4 \mu\text{m}$, ovoid hyaline, inamyloid, smooth (!).

Spores of typical European collections of *Calocybe leucocephala* (Fr.) Sing. are distinctly warted and measure $7-10 \times 4-6 \mu\text{m}$ [22, 25].

29. *Omphalina campanella* (Batsch) Fr. -HM. 12598

= *Xeromphalina* sp.

Material in good condition. Spores $4.5-5.5 \times 1.5 \mu\text{m}$, cylindrical to sub-lantoid, hyaline, strongly amyloid, smooth. Cheilocystidia $20-26 \times 5-6 \mu\text{m}$, broadly fusoid. Pileocutis with \pm clavate dermatocystidia.

The Yunnanese specimens represent an undescribed species related to *Xeromphalina podocarpi* Horak [14] reported from rotten wood of *Podocarpus* in New Zealand.

30. *Marasmius urens* Fr. -HM. 12862

= *Collybia peronata* (Bolton: Fr.) Sing.

Five well preserved basidiomes. Stipes velutinous above, strigose at base. Spores $8-11.5 \times 2.5-3 \mu\text{m}$, virguliform, inamyloid.

31. ? *Marasmius erythropus* (Pers.) Fr. -HM. 1656

= ?

Single moulded specimen. Spores $6-8.5 \times 3-3.5 \mu\text{m}$, cylindrical, hyaline, amyloid. Cheilocystidia $50-70 \times 16-25 \mu\text{m}$, broadly fusoid to uteriform, hyaline, thin-walled membrane.

In the current literature *M. erythropus* is considered a synonym of *Col-*

lybia marasmioides (Britzm.) Brsky & Stangl [25]. According to the microcharacters found the present material is not conspecific with this taxon whose taxonomic position remains doubtful.

32. ? *Marasmius ramealis* (Bull.) Fr. (f.) -HM. 6623

= *Marasmius* sp.

Five basidiomes in good condition. Stipe up to 45×0.5 mm, smooth, black. Pileus - 5 mm diam., hemispherical. Spores $6.5-9.5 \times 3-3.5$ μ m, virguliform, hyaline, inamyloid, smooth. Cheilocystidia with irregularly branched finger-like projections. Clamp connections present.

Macroscopical and microscopical characters of this collection leave no doubt about its misidentification.

33. ? *Marasmius parishii* Cooke -HM. 6657

= *Marasmius* sp.

Spores $7-10 \times 3.5-4$ μ m, broadly virguliform, hyaline, inamyloid. Cheilocystidia broom-like, clavate, -30×-8 μ m, identical with cells in pileocutis.

M. parishii is described by Cooke [5] from Burma. Since the original description lacks information about microscopical characters the identity of the delicate Yunnanese agaric can not be confirmed.

34. ? *Marasmius insiticius* Fr. -HM. 6622

= ?

Several tiny basidiomes in bad condition. Spores $8-10.5 \times 4-5$ μ m, elliptical to subvirguliform, hyaline, inamyloid. Other microscopical characters not recovered.

35. *Collybia longipes* (Bull.) Fr. -HM. 12869

= *Oudemansiella* sp.

Single basidiome in fragmentary condition. Spores $13.5-16.5 \times 10-12.5$ μ m, ovoid. Cheilocystidia and pleurocystidia $70-110 \times 18-26$ μ m, fusoid, apex pestle-like enlarged, thick-walled, hyaline. Pileocutis composed of clavate cells intermixed with slender dermatocystidia, apex pointed, orange-brown membrane thick-walled. Clamp connections present.

Obviously the material belongs to a taxon closely related to *Oudemansiella longipes* (Bull. ex St. Amans) Moser [22, 25]. It is distinguished from the latter species, however, by much larger spores and cystidia of different shape.

36. *Collybia dryophila* (Bull.) Fr. -HM 6652

= *Collybia dryophila* (Bull.: Fr.) Kummer

Exsiccata well preserved. Spores $4.5-6.5 \times 2.5-3$ μ m, obovate to virguliform, hyaline, inamyloid. Cuticular hyphae with irregular finger-like

projections.

37. *Collybia velutipes* (Curtis) Fr. (f.) -HM. 12966
= *Flammulina* sp.

Four moulded basidiomes with eccentric to lateral cylindrical stipe. Spores $6-7.5 \times 2-2.5 \mu\text{m}$, cylindrical to subballantoid, hyaline, smooth, amyloid. Cheilocystidia not recovered. Caulocystidia numerous. Pileocutis composed of irregularly interwoven cylindrical gelatinized hyphae, intermixed with fusoid dermatocystidia, membranes encrusted with orange-brown pigment or pigment localised in hyphal walls. Clamp connections present.

The material represents an undescribed yet taxon of *Flammulina*. It is separated from *F. velutipes* (Curtis: Fr.) Sing. by its much smaller spores [22, 25].

38. *Laccaria laccata* (Scop.) Berk. & Br. -HM. 12867
= ?, no material in WU.

39. ? *Nolanea mammosa* (L.) Fr. -HM. 1559
= *Entoloma* sp.

Single basidiome in good condition. Pileus umbilicate (!). Spores $9-11 \times 7-8 \mu\text{m}$, (4-) 5-angled. Cheilocystidia $35-75 \times 6-12 \mu\text{m}$, slender fusoid to cylindrical, with yellow-brown pigment.

The presence of conspicuous cheilocystidia with brown plasmatic pigment definitely proves the misidentification of the material which in addition belongs to subgen. *Leptonia* and not to subgen. *Nolanea* as assumed by Bresadola [26].

40. *Naucoria semiorbicularis* (Bull.) Fr. -HM. 3093, 6625, 12860
= *Agrocybe semiorbicularis* (Bull. ex St. Amans) Fayod

All three Yunnanese collections are correctly identified (40).

41. *Naucoria vervacti* Fr. -HM. 10857, 12661
= *Agrocybe vervacti* (Fr.) Sing -HM. 12661

Single basidiome with pale ochre pileus and tobacco brown lamellae. Spores $7.6-8 \times 4.5-5 \mu\text{m}$, brown, thick-walled, germ pore present. Pileocutis a celluloderm composed of clavate cells.

- The microscopical characters fully agree with European collections [22, 40].
= *Pholiota* sp. -HM. 10857

Spores $6-7 \times 3.5 \mu\text{m}$, phaseoliform, brown, with small germ pore. Cheilocystidia and pleurocystidia fusoid, with in KOH yellow plasmatic and encrusting pigment.

42. *Naucoria similis* Bres. -HM. 12690
= *Phaeocollybia similis* (Bres.) Sing.

Complete description and illustration in [2, 13].

43. ? *Naucoria sideroides* (Bull.) Fr. -HM. 11369

= ?

Well preserved basidiomes with rust brown lamellae. Spores $8.5-10 \times 4.5-5 \mu\text{m}$, ellipsoid, brown, membrane thick-walled, apical germ pore. Cheilocystidia $35-75 \times 6-10 \mu\text{m}$, cylindrical-clavate, occasionally with yellow-brown plasmatic pigment. Clamp connections present.

The microscopical characters do not at all correspond to those of *Galerina siderodes* (Fr.) Kühn. [19]. Taxonomic position of the material unknown.

44. *Naucoria flava* Bres. -HM. 12353

= ? , no material in WU.

45. *Galera ovalis* Fr. -HM. 12959

= *Conocybe subovalis* (Kühn. ex) Kühn. & Watl.

Single specimen in good condition. Spores $11.5-15 \times 6.5-8 \mu\text{m}$; ellipsoid, rust brown to ochre, membrane thick-walled, conspicuous germ pore. Cheilocystidia and caulocystidia lecythiform, $15-25 \mu\text{m}$ long, capitate apex $4-6 \mu\text{m}$ diam.

All characters observed on the exsiccatum support its identification as *G. subovalis* [19, 40].

46. *Inocybe trechispora* Berk. (f.) -HM. 10104, 10391, 12868

= *Inocybe* spp.

All exsiccata in rather good condition.

10391=12868: Spores angular, rarely with obtuse knobs. Cheilocystidia and caulocystidia metuloid, fusoid, encrusted with crystals.

10104: Spores similar to the two before mentioned collections but larger. Cheilocystidia and pleurocystidia broadly fusoid, membrane only about $1 \mu\text{m}$ diam., occasionally encrusted with crystals.

The comparison with type material of *I. trechispora* revealed that the three Yunnanese collections are definitely not representing this taxon whose spores bear conspicuous and numerous knobs.

47. *Inocybe scabella* Fr. -HM. 12964

The characteristic odour is not reported for this Yunnanese material. However spores and cystidia closely resemble in size and shape those in European collections [22].

48. *Inocybe rimosa* (Bull.) Fr. -HM 12599

= *Inocybe* sp.

This doubtful taxon is considered synonymous to *I. virgatula* Kühn. [21]. The Yunnanese material, however, is separated from Kühner's species by its larger spores.

49. ? *Inocybe dulcamara* Alb. & Schw. -HM. 10789

= *Naucoria* sp.

Spores $9-11 \times 5-5.5 \mu\text{m}$, ellipsoid, pale yellow-brown, minutely warted, germ pore absent. Cheilocystidia $40-55 \times 5-10 \mu\text{m}$, cylindrical to slender fusoid, often with yellow plasmatic pigment. Clamp connections present. Pileocutis composed of clavate cells forming a single-layered celluloderm.

50. *Cortinarius cotoneus* Fr. vel *C. infractus* (Pers.) Fr. -HM 12857
= *Cortinarius (Leprocybe) cotoneus* Fr.

Three well preserved basidiomes with brilliant ochre lamellae. Surface of pileus covered with black scaly squamules. Spores $6.5-8 \times 5-7 \mu\text{m}$, subglobose to oval, coarsely warted, rust brown. Pileocutis composed of cylindrical hyphae with in KOH olive-grey plasmatic pigment, terminal cells conical.

51. *Cortinarius castaneus* (Bull.) Fr. -HM. 12029

= *Cortinarius* sp.

Single basidiome destroyed by moulds and insects. Spores $8-9.5 \times 4.5-5 \mu\text{m}$, elliptical, warted, rust brown. No further microscopical information recovered.

52. *Hebeloma hiemale* Bres. (f.) -HM. 12131, 12847

= *Hebeloma* sp.

Spores and cheilocystidia resemble in size and shape those of European collections of *H. hiemale* [2]. Since no macroscopical data are available, however, the correct identification of the two specimens remains doubtful.

53. ? *Pholiota aegerita* (Brig.) Fr. -HM. 10821

= ?, no material in WU.

54. ? *Pholiota adiposa* Fr. -HM. 10077

= ?, no material in WU.

55. *Pholiota marginata* (Batsch) Fr. -HM. 12871

= *Hypholoma* sp.

Spores $6.5-7.5 \times 4-4.5 \mu\text{m}$, ovoid, grey, opaque, small apical germ pore. Chrysocystidia numerous.

56. *Rozites caperata* (Pers.) Karst. -HM. 12744

= *Stropharia* sp.

Three well preserved basidiomes. Stipe -100 mm long, with persistent membranous ring. Spores $10.5-13 \times 7-8 \mu\text{m}$, elliptical, brown, thick-walled membrane, large apical germ pore. Chrysocystidia numerous.

57. *Flammula spumosa* Fr. -HM. 12853

= *Pholiota* sp.

Material in good condition, basidiomes in clusters. Spores $7.5-8.5 \times 4-4.5 \mu\text{m}$, elliptical, brown, germ pore small. Cheilocystidia and pleurocystidia

30—60 × 7—14 μm , fusoid, hyaline, membrane thin-walled, yellow-brown pigment both encrusting and plasmatic. Clamp connections present.

Microscopical characters are not conform with those observed in European specimens [22, 25].

58. *Flammula penetrans* Fr. -HM. 11009, 12872

= *Cymnopilus penetrans* (Fr.: Fr.) Murrill -HM. 11009

Single poor specimen with rust brown to ochre lamellae. Spores 8—9 × 4.5—5 μm , amygdaliform, rust brown, coarsely warted, plage distinct. Cheilocystidia numerous, fusoid-capitate.

= *Galerina* sp. -HM. 12872

Single basidiome damaged by insects, on rotten bark. Spores 6.5—8 × 4—5 μm , elliptical, rust brown, minutely warted or roughened, plage absent. Cystidia not observed.

59. *Psilocybe uda* (Pers.) Fr. -HM. 12647

= *Chroogomphus* sp.

Material well preserved. Spores 16—19 × 6—7 μm , fusoid, grey-brown, opaque, no germ pore. Pleurocystidia 100 × 25 μm , broadly fusoid, membrane hyaline, thin-walled, in KOH with yellow-brown encrusting and/or plasmatic pigment.

60. *Psilocybe polytrichi* (Fr.) Bres. -HM. 12845

= *Hypholoma ericaeum* (Pers.: Fr.) Sing.

Single basidiome in good condition. Lamellae tobacco brown. Spores 9.5—11 × 5.5—6.5 μm , ovoid, brown, membrane thick-walled, broad apical germ pore. Cheilocystidia fusoid-capitate, often with resinous incrustation. Chrysocystidia numerous. Clamp connections present.

The microscopical characters are distinctive in all details with *H. ericaeum* [20].

61. *Hypholoma sublateritium* (Fr.) Bres. -HM. 12844

= *Hypholoma* sp.

Material in good condition. Centre of pileus chestnut brown. Lamellae tobacco brown. Spores 8—9.5 × 4—4.5 μm , elliptical, grey-brown, opaque, germ pore distinct. Chrysocystidia numerous. European collections of *H. sublateritium* (Fr.) Quél. are distinguished by smaller spores with minute germ pore [22, 25].

62. *Hypholoma candolleanum* Fr. -HM. 6624

= *Coprinus* sp.?

Material consists of immature cespitose basidiomes. Spores 7.5—8.5 × 4—5 μm , elliptical to obovate, brown-black, opaque, membrane thin-walled,

broad germ pore with conspicuous hyaline callus.

The peculiar spores observed on the material rule out its identity with *Psathyrella candolleana* (Fr.: Fr.) Maire [41].

63. *Stropharia stercoraria* Fr. -HM. 12864

= *Stropharia semiglobata* (Batsch: Fr.) Quél.

Several badly preserved basidiomes. Lamellae chocolate brown. Spores $15-20 \times 10-12 \mu\text{m}$, elliptical, brown, membrane thin-walled, large subdorsal germ pore. Cheilocystidia fusoid with capitate apex, hyaline, thin-walled.

64. ? *Lepiota irrorata* Quél. -HM. 11214

= ?, no material in WU.

65. *Lepiota amianthina* (Scop.) Fr. -HM. 10267

= *Cystoderma fallax* Smith & Sing.

Single basidiome. Stipe with conspicuous membranous annulus. Spores $4-4.5 \times 2.5-3 \mu\text{m}$, elliptical, hyaline, weakly amyloid.

66. *Lepiota cinnabarina* (A. & S.) Karst. -HM. 8063

= *Cystoderma* sp.

Single small basidiome. Pileus rust brown, granulose. Spores $3.5-4.5 \times 2.5 \mu\text{m}$, elliptical, hyaline, inamyloid. Cheilocystidia not recovered, present or absent ?.

Bresadola's identification of this material can not be confirmed. Since no lanceolate cheilocystidia were detected on the rather young and immature specimen. In addition the spores of both *C. cinnabarinum* (A. & S. ex Secr.) Fayod and *C. granulorum* (Batsch: Fr.) Fayod are similar in size, shape and chemical reactions in Melzer's reagent and therefore the two taxa are difficult to separate with exsiccata alone.

67. *Lepiota clypeolaria* (Bull.) Fr. -HM. 12656

= *Lepiota clypeolaria* (Bull.: Fr.) Kummer

Well preserved specimen, with pale yellow veil remnants on stipe. Spores $13-14.5 \times 4.5-5.5 \mu\text{m}$, fusoid, distinct supraapical depression, membrane dextrinoid.

68. *Amanita pantherina* DC. -HM. 11025

= *Amanita pantherina* (DC.: Fr.) Secr.

Material in good condition. Pileus 50 mm diam., centre reddish brown, brown towards sulcate-striate margin, covered with conspicuous white patches of veil. Volva white, membranous-saccate. Spores $9-11 \times 7-9 \mu\text{m}$, ovoid, hyaline, inamyloid.

69. *Cantharellus floccosus* Schw. -HM. 12969

= *Gomphus floccosus* (Schw.) Sing.

Single basidiome in good condition. Spores $13-18 \times 5.5-7 \mu\text{m}$, subfusoid, pale yellow-brown, roughened to corrugated.

70. *Craterellus clavatus* (Pers.) Fr. -HM. 4156, 12965

= *Gomphus clavatus* (Pers.: Fr.) S. F. Gray

Both Collections are in very poor condition (4156 sterile). Spores (in 12965 $13-21 \times 5-6.5 \mu\text{m}$, cylindrical to subfusoid, pale yellow-brown, roughened to minutely warted.

71. *Craterellus cornucopioides* (L.) Pers. -HM. 12960

= *Craterellus cornucopioides* (L.) ex Pers. (forma bispora)

Moulded specimen. Spores $10-14 \times 6.5-7.5 \mu\text{m}$, elliptical to subphascoliform, hyaline, smooth, inamyloid. Basidia $65-80 \times 6-8 \mu\text{m}$, 2-spored, clamp connection at basal septum.

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云南北部的牛肝菌目和伞菌目

I. 对H. HANDEL-MAZZETTI(1914—1916) 在丽江所采真菌标本的订正

E. Horak

(瑞士联邦工大地植物研究所标本馆)

摘要 奥地利韩马迪 H. Handel-Mazzetti 在丽江所采的真菌标本, 其中由 H. Lohwg 等所鉴定已在 1937 年发表在中国植物汇编 (Symbolae Sinicae) 第二卷中, 长期被研究中国真菌学者所引用。这些标本现被保存在维也纳大学植物研究所的标本馆 (WU) 中。由于经历了第二次大战的蹂躏, 加以无人问津, 这些标本不少或被虫蚀或遭霉腐。作者在复查有关牛肝菌目和伞菌目的 71 号标本中, 其中 7 号已下落不明, 其中 32 号鉴定有误, 如不纠正, 必导致于引用文献时以讹传讹, 故作者将所见标本作了订正, 这对研究中国的真菌该是有益的。

关键词 牛肝菌目, 伞菌目, H. Handel-Mazzetti